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**Knopp et al.**

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(54) **SYSTEMS AND METHODS FOR IMPROVED  
ENGAGEMENT BETWEEN ALIGNERS AND  
TEETH**

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This patent is subject to a terminal dis-  
claimer.

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CPC .... **A61C 7/08** (2013.01); **A61C 7/00** (2013.01)

(58) **Field of Classification Search**

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See application file for complete search history.

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(57) **ABSTRACT**

A system and method for repositioning teeth in a patient jaw  
includes an attachment bonded to a tooth. The attachment has  
at least one force receiving component for receiving a force.  
A polymeric shell repositioning appliance is positioned over  
at least some of the teeth in the patient jaw. The polymeric  
shell has at least one force transmitting component for engag-  
ing the force receiving component to form a locus of engage-  
ment. The locus of engagement transmits the force and moves  
but is maintained as the tooth is repositioned. In specific  
embodiments the locus of engagement is maintained over a  
substantial range of motion. The force transmitted at the locus  
of engagement increases in response to the tooth lagging an  
intended position. A space between the positioned appliance  
and the tooth permits the tooth to move into an intended  
position.

**26 Claims, 25 Drawing Sheets**

